THE ORCHIDS OF THE CAPE PENINSULA.

The Orchids of the Cape Peninsula. By Harry Bolus, F.L.S. With Thirty-six Plates, partly coloured. Offprint from the Transactions of the South African Philosophical Society, 1888, Vol. V., Part 1. (Cape Town, 1888.)

"THIS," as the author informs us, "is an attempt to describe the Orchids growing on the peninsula of the Cape of Good Hope; to give their names and synonyms; to arrange them as far as possible in groups; to adduce the stations where they have been found, and their further distribution so far as known. To this is added a list of collectors; and of books and papers already published upon the subject of South African Orchidology." Mr. Bolus's name as an authority on Cape Orchids is already well known through his papers in the Journal of the Linnean Society; and the thoroughness with which his work has been done is vouched for by the fact that it has occupied a great part of his leisure time for several years, and embodies the results of a comparison of the Orchids of Thunberg's Herbarium, by Mr. N. E. Brown, A.L.S.; also by the fact that Lindley's Type Herbarium, and the General Herbarium, at Kew, where Mr. Bolus has been staying for several months, have been fully consulted.

The Cape peninsula is a tract of land about forty miles long, varying in width from about three to eleven miles, and has a total area of 197½ square miles; and it is interesting to note that in an area about one-fourth larger than the Isle of Wight, no less than 102 species, belonging to ten genera are found, thirty-three of which, so far as at present known, are endemic. The order is considered to take a position the fourth in importance in the flora (after Compositæ, Leguminosæ, and Ericaceæ), and to constitute 5·8 of the whole. The altitudinal range of the species is very interesting. The greater part of the area in question is occupied by a central mountain range, of which Table Mountain, which attains an elevation of 3562 feet, is the highest part. From Mr. Bolus's tables, it appears that fifty-nine species never descend into the plains to a lower elevation than 500 feet, twenty others are always found below this elevation, while the twenty-three remaining ones are indifferent in this respect. He also remarks that fifteen species have a vertical range of from 2000 to 3000 feet, and six species a range of more than 3000 feet. This large vertical range, which is shared in common with many of the flowering plants, Mr. Bolus attributes to the equability of the temperature, and of the moisture of the atmosphere at different elevations, owing to the close proximity of the sea on nearly every side.

One of the species is of such great beauty that there has been some danger of its ultimate extinction; on which points the following will be read with interest. "The peerless *Disa uniflora* is in its glory on the rivulets of Table Mountain in February. . . . This beautiful flower is the object of universal admiration, and the name which has been given to it, the 'Pride of Table Mountain,' indicates the honour in which it is held. It is, indeed, the queen of terrestrial Orchids in the southern hemisphere, as *Cypripedium spectabile* may be said to reign, though with less magnificence, in the northern. . . . It is still abundant on Table Mountain, although of late years large quantities of the tubers have been annually exported to Europe, and much needless destruction, arising from wasteful gathering by unskilled hands, resulted. But the summit of the mountains being Crown land, the Government has recently intervened, and restricted the removal of tubers within reasonable limits, so that, if this supervision be continued, there will be little reason to fear the extinction of this truly noble species."

The thirty-six, partly coloured, plates, which represent the rarer or least-known species, are drawn by the author, and the dissections and botanical details are admirably portrayed; though in some cases the outline only is given, and a little shading would have enhanced their effect.

Respecting the structure and homologies of Orchideæ, largely cited from Darwin, and with a plan of the flower from the same source, it may be pointed out that the so-called union of the two lateral stamens of the outer staminal whorl with the median petal, to form the lip, was disputed, and, I think, satisfactorily disproved, by Crueger; a view which has been since confirmed by Dr. Masters, in the case of *Cypripedium*. The papers in question appear to have been overlooked, but the oversight detracts little from the value of this admirably executed work. To those who wish to procure copies, the omission of the publisher's name is unfortunate. Messrs. West, Newman, and Co., of Hatton Garden, E.C., are the printers, and may be able to supply the work.

R. A. ROLFE.

OUR BOOK SHELF.

Carl von Linné's ungdomsskrifter. Samlade af Ewald Ährling, och efter hans död med statsunderstöd utgifvna, af K. Vetenskaps-Akademien. Första serien, första häftet. (Stockholm: P. A. Norstedt & Söner, 1888.)

THIS is the first part of the youthful writings of Linnæus, collected by the late Dr. Ewald Ährling, and published, under a State grant, by the Royal Swedish Academy of Science. The work as a whole is to be divided into two series of several parts each, the first series including a record of the life of Linnæus up to the year 1734, with botanical addenda. The second will contain the author's account of his journeys in Lapland (1732), hitherto printed only in English; in Dalabergslagen (1733); in Dalecarlia (1734); and notes on his sojourn abroad (1735). In the first series are the following purely botanical works:—"Hortus Uplandicus," after Tournefort's system, from the original in the possession of the Linnean Society; "Hortus Uplandicus," after Tournefort's system, with an addendum, and a new division of Umbellatæ (1730), from the original in the Leufsta Library; "Hortus Uplandicus," after the author's method the sexual system (1731), original in possession of the Rev. J. Johansson, at Ifvetofta; and "Adonis Uplandicus," after the sexual system (1731), original in the Leufsta Library.

The majority of readers will find that the most interesting of the papers in the part before us is the great botanist's diary. The original of this, wholly in the handwriting of Linnæus, is one of the two autographs in the possession of the Linnean Society. It contains thirteen closely-written pages, and we must conclude, from a remark in the diary, that it was written between 1730 and 1735. To judge from difference of writing and ink, additions were made at a later date.

The diary is followed by "Catalogus Plantarum

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Rariorum Scaniæ item Catalogus Plantarum Rariorum Smolandiæ" (1728), in the possession of the De Geer family (Leufsta Library); and by "Spolia Botanica" (1729), the original of which is in the possession of the Linnean Society, and is considered to have been finished towards the end of 1729. This seems, however, improbable, the date of dedication (to Prof. Roberg, one of Linnæus's teachers at Upsala) being May 5, 1729. The work is accompanied by twelve facsimile drawings of the principal representatives of the Lapland flora.

This part of the first series contains copious and explanatory notes by the late Dr. Ährling, a work which must have entailed very great labour. After his death, his editorial duties were undertaken by Dr. M. B. Swederus. The second series will be edited by Prof. G. Lindström.

First Principles of Physiography. By John Douglas (London: Chapman and Hall, 1889.)

THE ever-increasing number of text-books on this subject is evidence that the study of physiography is gaining in popularity. The object of the book before us, as the author states in his "Prologue on the Beach," is to give a systematic statement of the nature of the forces at work in the world, and of the changes which the matter of the world undergoes. The book is obviously designed to cover the syllabus issued by the authorities at South Kensington, although no mention of this fact is made.

The first part of the book deals with force, but for some reason or other, force is not defined until p. 26, and there only in an obscure place. The author's notion of treating elementary chemical ideas is somewhat peculiar; to make statements about positive and negative elements without explaining the meanings of those terms, and to use formulæ like NH_3 and H_2SO_4 (p. 36) without naming the compounds they represent, is scarcely the way to inspire a student with confidence in his teacher.

No less than 23 pages are devoted to tables, all of more or less interest to students of physiography.

Perhaps the chief novelty of the book is the introduction of copious quotations from, and references to, standard works. Their introduction as footnotes, however, is rather objectionable, as it tends to discontinuity. A good deal of information is undoubtedly given, but the style is not such as to commend it to those who are just commencing the study of science, and these, it must be remembered, constitute the majority of those who take up the subject of physiography.

LETTERS TO THE EDITOR.

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"Engineers" *versus* "Professors and College Men."

PROF. GREENHILL is, himself, one of many proofs that the distinction between "Engineers" and "Professors and College Men" is a Cross Division. Every "Engineer" ought to be a "highly-trained College man." If he were, he would know at once, from the very first sentence of the Principia (*Quantitas materiæ est mensura ejusdem* &c., &c.) that mass is the personal property of a body, one of the invariable things in nature:—and not an accidental property dependent, for its amount and even for its very existence, on the momentary surroundings. The letter M has hitherto been used by Newtonians in this sense. If anyone has since attached to it another and different sense, *he* is responsible for the consequent confusion. Would it not be well if Prof. Greenhill, and the School to which he has attached himself, would kindly leave to Newtonians their M, as defined for them by their Master; and (with severely logical consistency) turn it upside down (thus, W) when they wish to embody their own revolutionary definition? No Newtonian will refuse to recognize $Wv^2/2g$ as a correct expression for so much energy:—though he will probably think it both clumsy and complex, and will prefer to write as usual his $Mv^2/2$.

I am curious to know how Prof. Greenhill would deal with physical Astronomy. What is his measure of the earth's mass? According to the analogy of his "*units of* g *pounds*" the earth's mass is at present (near perihelion) to be spoken of as if it were some 6 or 7 per cent. greater than it was six months ago!

The whole of this attempt to improve on Newton is caused by unwillingness to face, once for all, the small amount of labour and thought requisite for learning or teaching how to pass from one system of units to another. A properly taught student learns, very early in his career, that this is no awful and mysterious process:—in fact that it is, throughout, quite as simple in principle as is the passing from miles per hour to feet per second.

And I venture to assert that such a student would attack with ease and confidence any *fair* question (*i.e.* one free from mere tricks or traps) connected with the subject. This one, for intance:—

"How many of the following quantities (taken in order) can, by selection of the requisite system of units, be simultaneously expressed by one and the same *number*. *First*, when that number is given? *second*, when it is not?

(*a*) The weight of a ton, at sea-level, at the equator.

(*b*) The speed of light *in vacuo*.

(*c*) The average kinetic energy of a particle of hydrogen at 0° C.

(*d*) The minimum compressibility of water at low pressures.

(*e*) The mean angular velocity of the earth about the sun.

Express the requisite units in C.G.S. measure, when the common numerical value, above mentioned, is $\log_\epsilon \pi$; and also when it is not assigned."

Of course it is understood, and this is my answer to Prof. Greenhill's first question, that *the student would be furnished with all the necessary data*, experimental or otherwise, expressed in definite *assigned* units.

In answer to Prof. Greenhill's second question I need only say that it is no part of my case to assert that all statements, made by "College men," are *necessarily* characterized by definiteness, by accuracy, or even by common-sense.

December 21, 1888. P. G. TAIT.

The Sun-spot Cycle.

IT may interest some of the readers of NATURE to learn that an expected change has just been observed upon the solar surface.

It is a well-established fact that in each new series of sun-spots the first spots of the cycle are seen in high solar latitudes, and that as the number of spots increases there is a common drift towards the sun's equator, the spot area becoming most extensive as the sixteenth parallel of heliographic latitude is reached. During late years the spots have been diminishing in number and size, and approaching the solar equator; and in the past twelve months very few spots have been seen on the sun's surface, and all in low latitudes, that recorded on December 21 being 4° south of the solar equator. The close of the year has, however, witnessed a change, as a small spot is recorded on the Stonyhurst drawing of December 30 at 36° south latitude. Spots near the equator will probably continue to be observed for some time, but, whilst they are diminishing, those in higher latitudes will be on the increase. S. J. PERRY.

Stonyhurst Observatory, Lancashire, December 31, 1888.

"Renaissance of British Mineralogy."

MR. FLETCHER's admirable address on a "Renaissance of British Mineralogy," of which a report was published in a recent issue of your paper, calls timely attention to the present condition of the science. Mineralogy as a popular study seems dead: the chemists have deserted it for a study of complex organic compounds, so that it has become a mere hanger-on of geology. The science is now not thoroughly taught in any institution in this country, and teachers therefore have no means of acquiring knowledge, in the only really useful way, by working under the acknowledged masters. This is especially the case with

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